Lesson 3: Numbers in Exponential Form Raised to a Power

Classwork

For any number x and any positive integers m and n,	
$x^{m-n} = x^{mn}$ because	
$x^{m \ n} = x \cdot x \cdots x^{n}$ $m \text{ times}$	
$= x \cdot x \cdots x \times \cdots \times x \cdot x \cdots x$ <i>m</i> times <i>n</i> times <i>n</i> times	
$= x^{mn}$.	

Exercise 1	Exercise 3
$15^{3} =$	3.4^{17} ⁴ =

Exercise 2	Exercise 4
$-2^{58} =$	Let <i>s</i> be a number.
	$S^{17} =$

Exercise 5

Sarah wrote 3^{5} $^{7} = 3^{12}$. Correct her mistake. Write an exponential expression using a base of 3 and exponents of 5, 7, and 12 that would make her answer correct.

Exercise 6

A number y satisfies $y^{24} - 256 = 0$. What equation does the number $x = y^4$ satisfy?



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For any numbers x and y, and positive integer n,

because

 $xy^n = x^n y^n$ $xy^n = xy \cdots xy$ n times $= x \cdot x \cdots x \cdot y \cdot y \cdots y$ n times n times $= x^n y^n$.

Exercise 7	Exercise 10
$11 \times 4^{9} =$	Let <i>x</i> be a number.
	$5x^{7} =$
Exercise 8	Exercise 11

 $3^2 \times 7^{4} =$

Exercise 9	Exercise 12
Let a , b , and c be numbers.	Let a , b , and c be numbers.
$3^2 a^{4} 5 =$	$a^{2}bc^{3-4} =$

Exercise 13

Let x and y be numbers, $y \neq 0$, and let n be a positive integer. How is $\frac{x}{y}$ related to x^n and y	Let x and y be numbers, $y \neq 0$,	, and let n be a positive integer	. How is $\frac{x}{y}$	n related to x^n and y
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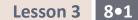
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Let *x* and *y* be numbers.

 $5xy^{2} = 7$



Problem Set

- 1. Show (prove) in detail why $2 \cdot 3 \cdot 7^{-4} = 2^4 3^4 7^4$.
- 2. Show (prove) in detail why $xyz^4 = x^4y^4z^4$ for any numbers x, y, z.
- 3. Show (prove) in detail why $xyz^n = x^n y^n z^n$ for any numbers x, y, and z and for any positive integer n.





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